

OPERATING SUMMARY

CITY OF
SAULT STE. MARIE
WATER POLLUTION CONTROL PLANT

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SAULT STE. MARIE
WATER POLLUTION CONTROL PLANT

operated for

THE CITY OF SAULT STE. MARIE

by the

MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

prepared by

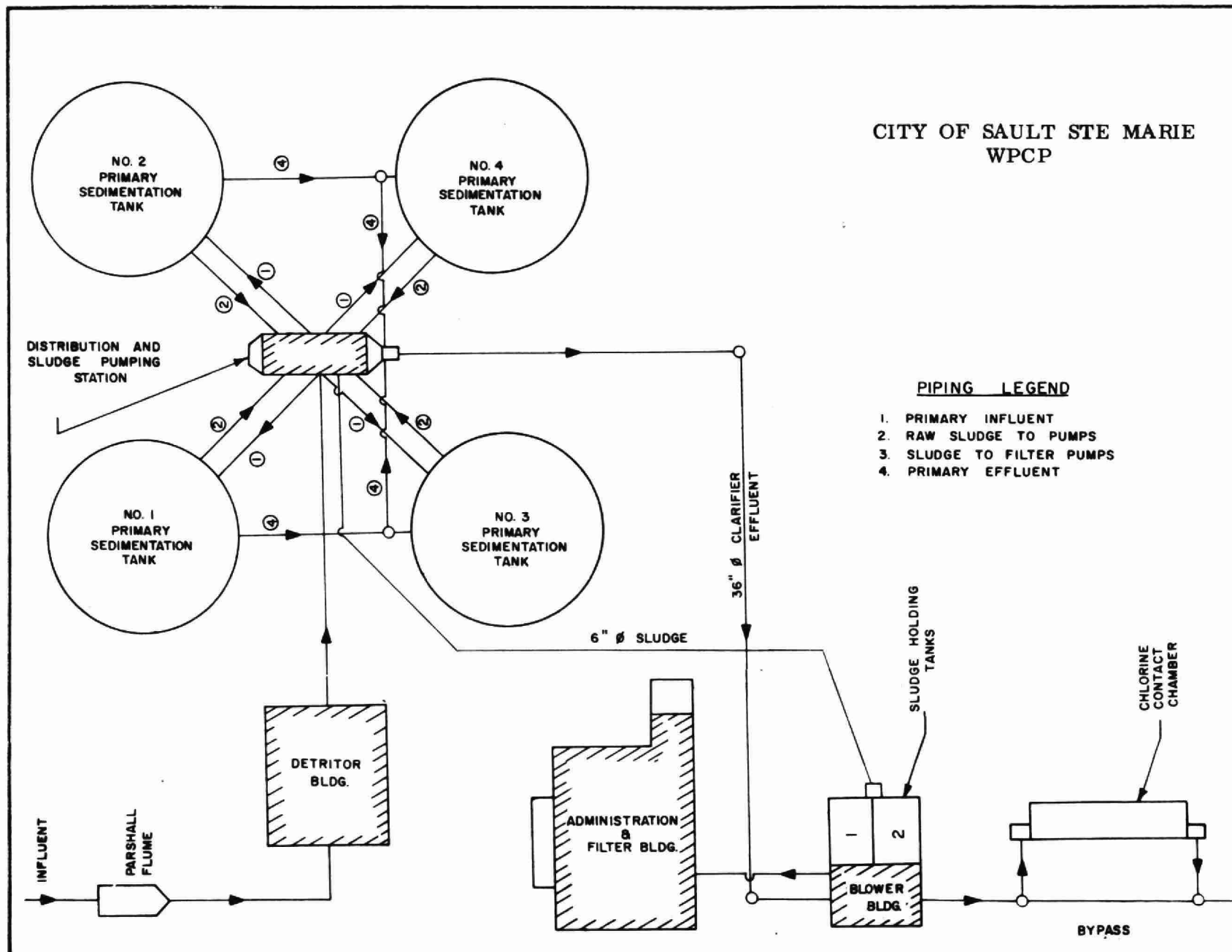
Plant Performance Unit

TECHNICAL SERVICES BRANCH

T. Cross, Director

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DESIGN DATA

PROJECT City of Sault Ste Marie
WPCP

PROJECT NO. 2-0020-58

TREATMENT Primary

DESIGN FLOW 8.0 mgd

DESIGN POPULATION 72,500

BOD - Raw Sewage 250 mg/l
- Removal 35%

SS - Raw Sewage 200 mg/l
- Removal 60%

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: Two Model C (36")

Grit Removal

Type: Dorr detritor
Size: Two 18' x 18' x 1'3"
(6,240 gal)
Retention: 1.13 min
Flow Velocity: 0.209 fps

Primary Sedimentation

Type: Dorr
Size: Four 70' dia x 8' swd
(900,000 gal)
Retention: 2.3 hr
Loading: Surface, 520 gal/ft²/day
Weir, 13,000 gal/ft/day

CHLORINATION

Type: W & T
Size: One 800 lb/day

Chlorine Contact Chamber

Size: One 60' x 20' x 12'
Reten (90,000 gal)
Retention: 16.2 min

OUTFALL

- to St. Mary's River

SLUDGE HANDLING

Holding Tank - Aerated

Size: Two 24' x 15' x 11½'
(8,280 cu ft or 51,600 gal)
Air Supply: One Sutorbilt

Vacuum Filter

Type: Komline-Sanderson
Size: Two 200 sq ft

PUMPING STATIONS

Pim Street Pumping Station

Type: Worthington
Size: One 10,000 gpm @ 50' tdh
(diesel)
Two 6,300 gpm @ 40' tdh
(electric)

Clark Creek Pumping Station

Type: Worthington
Size: One 12320 gpm (electric)
One 13000 gpm (diesel)
Two 7000 gpm (electric)
One diesel generator

Wiita Pumping Station (Temporary)

Type: Smart-Turner
Size: 2400 gpm @ 30' tdh (electrical)

'74 Review

GENERAL

The expansion of the plant to 12.0 million gallons was substantially completed in November. The two new clarifiers were put into operation in May and have been operating well. The amounts of raw sludge pumped to the holding tanks for vacuum filtration have increased proportionately to the increased efficiency of the clarification units.

The serviced population in 1974 was approximately 75,000 and the per capita flow was 132 gallons per day.

EXPENDITURES

The total operating cost for the year was \$229,389 representing an increase of 20 percent over the previous year.

The average cost per million gallons of sewage treated was \$64. The average cost per pound of BOD removed was 11 cents which is similar to the 1973 cost of 10 cents. The balance in the reserve fund at December 31, 1974 was \$248,365.80.

PLANT FLOWS AND CHLORINATION

The plant flowmeter was out of service from June to the end of the year and flows were estimated by taking direct readings at the Parshall flume several times a day which resulted in an average daily flow of 9.9 million gallons for the year.

A total of 198 thousand pounds of chlorine was used during the year, representing an average dosage of 5.5 mg/l.

PLANT EFFICIENCY

The raw sewage BOD and suspended solids concentration averages were 141 mg/l and 158 mg/l respectively which represent a BOD increase of 18 percent and a suspended solids increase of 5 percent from the previous year.

The final effluent BOD and suspended solids concentration averages were 80 mg/l and 53 mg/l respectively and represent a BOD and suspended solids removal efficiency of 43 percent and 66 percent respectively.

VACUUM FILTRATION AND SLUDGE DISPOSAL

A total of 8.981 million gallons of raw sludge was pumped to the vacuum filters at an average total solids content of 5.9 percent and a total of 9280 cubic yards at an average total solids content of 20.7 percent was hauled from the plant to the city's waste disposal site.

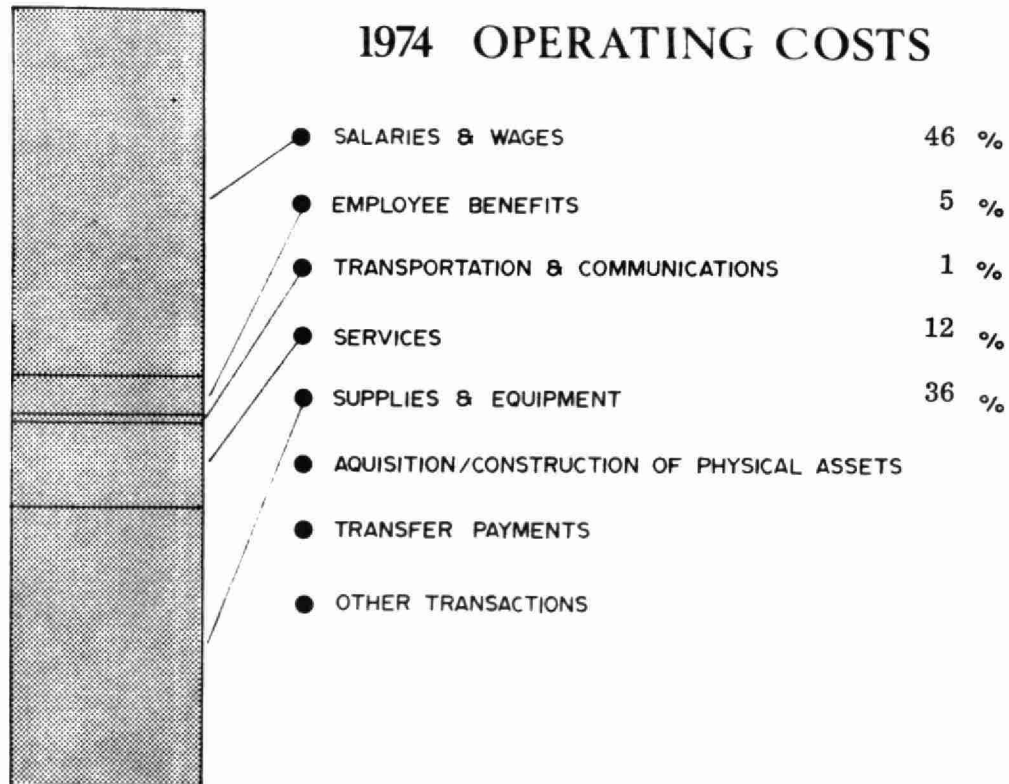
CONCLUSIONS

The plant produced a better-than-average quality of effluent for most of the year.

The efficiency of the process treatment noticeably improved after the new clarifiers were put into operation in May.

ANNUAL COSTS

1974 OPERATING COSTS



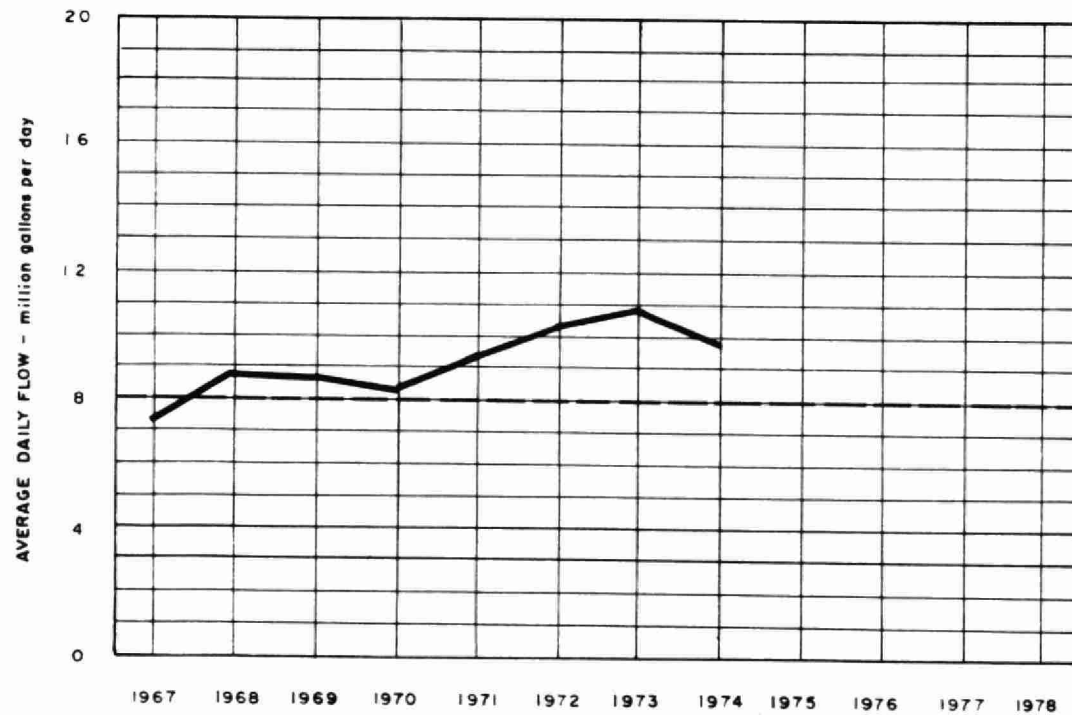
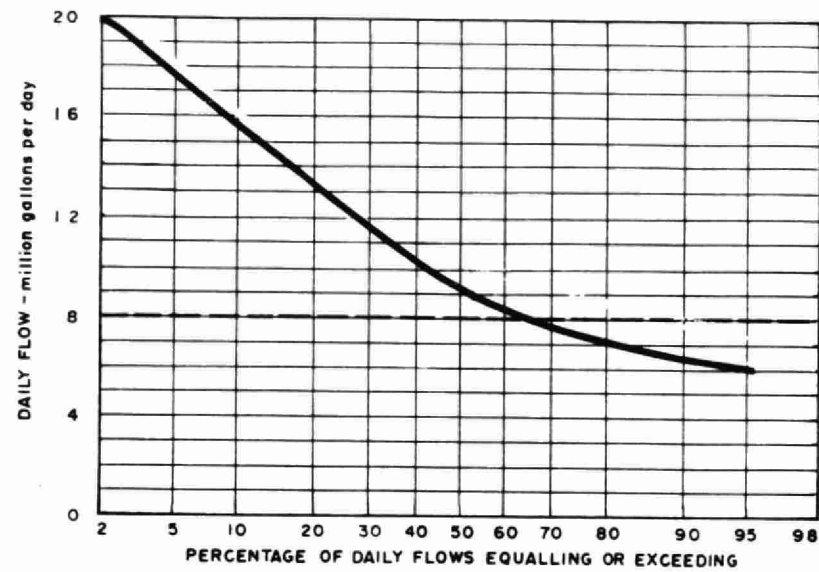
YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M.G.	¢/lb BOD
1969	3163	146,194	46	11
1970	3107	162,678	52	17
1971	3424	169,747	50	16
1972	3748	189,643	51	14
1973	3945	190,493	48	10
1974	3584	229,389	64	10

OPERATING EXPENDITURES

Regular Staff	\$ 105,885	\$
Casual (Unclassified) Staff	-	
TOTAL SALARIES AND WAGES		105,885
TOTAL EMPLOYEE BENEFITS		10,727
TOTAL TRANSPORTATION AND COMMUNICATIONS		2,624
Insurance	3,909	
Sludge Haulage	20,916	
Repairs and Maintenance	1,615	
Other Services	451	
TOTAL SERVICES		26,891
Machinery and Equipment	11,753	
Chemicals	19,462	
Utilities	47,265	
Other Supplies and Equipment	4,755	
TOTAL SUPPLIES AND EQUIPMENT		83,235
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		
TOTAL TRANSFER PAYMENTS		
OTHER TRANSACTIONS		27
GRAND TOTAL	GRAND TOTAL	\$ 229,389

PROCESS DATA FLOWS

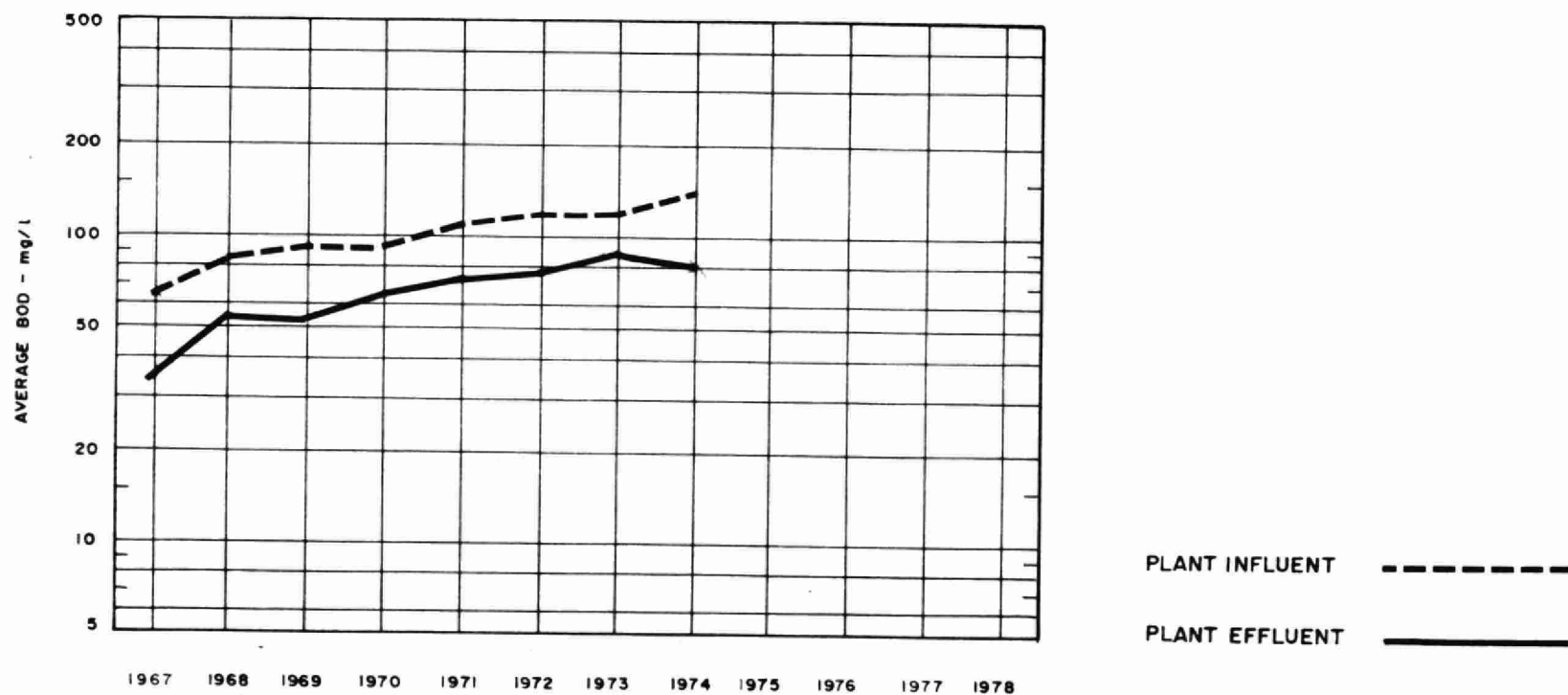
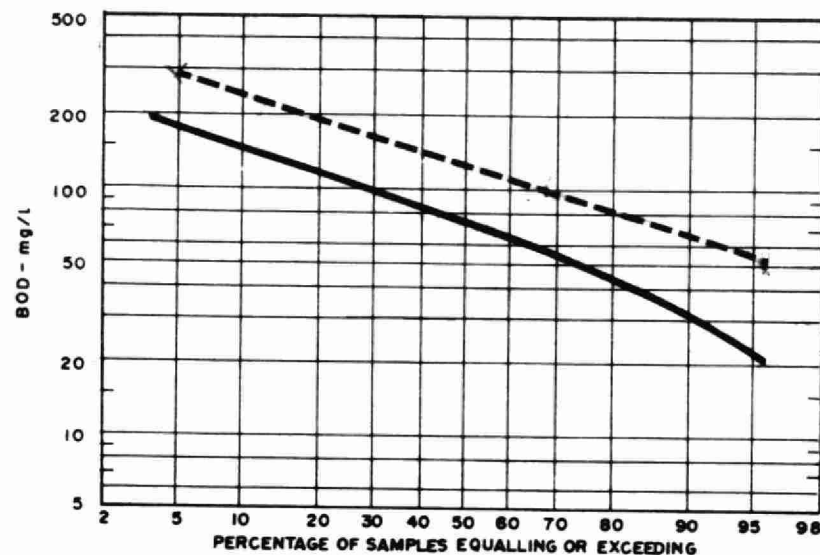


DESIGN CAPACITY — — — — —

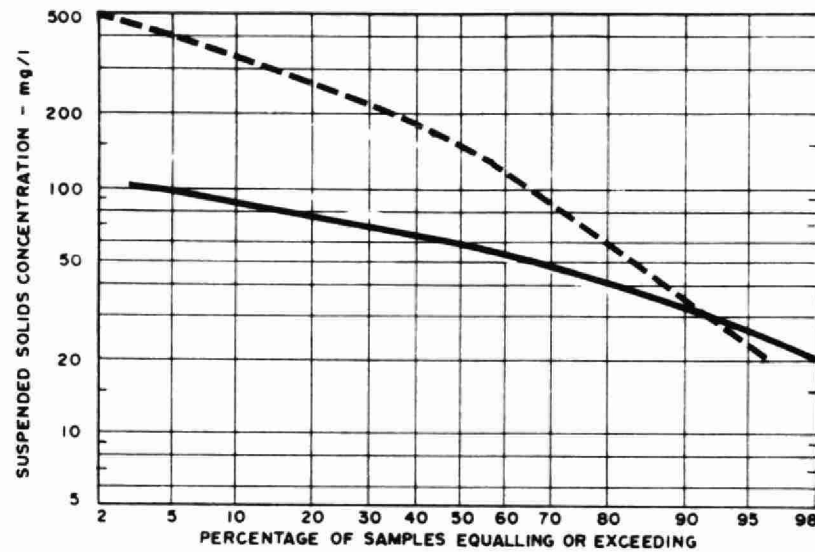
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 ³ pounds			%	10 ³ pounds		
JAN	284	9.2	9.8	217	160	26	162	141	56	60	239	5.6	3.4
FEB	243	8.7	9.5	176	133	25	104	133	51	62	199		
MAR	323	10.4	18.5	117	71	39	148	131	51	61	258	4.8	3.5
APR	475	15.8	28.2	86	68	21	85	140	68	51	342	3.9	3.1
MAY	276	8.9	11.7	153	88	42	180	176	61	65	318	6.0	
JUNE	302	10.1	17.3	98	53	46	136	156	57	63	299	3.9	2.6
JULY	276	8.9	12.5	97	60	38	102	208	54	74	426		
AUG	306	9.9	12.3	117	58	50	181	232	48	79	563	5.7	3.6
SEPT	317	10.6	14.0	158	67	58	288	172	48	72	393	8.2	3.7
OCT	253	8.2	12.6	189	86	54	261	195	45	77	380	15.0	3.0
NOV	330	11.0	17.6	172	130	24	139	128	56	56	238	3.0	3.4
DEC	199	6.4	7.7	138	64	54	147	159	45	72	226	5.9	3.4
TOTAL	3584	-	-	-	-	-	2186	-	-	-	3763	-	-
AVG.	299	9.9	MAXIMUM 28.2	141	80	43	182	158	53	66	314	5.9	3.3
No. of Samples	-	-	-	94	94	-	-	197	185	-	-	20	19

BIOCHEMICAL OXYGEN DEMAND

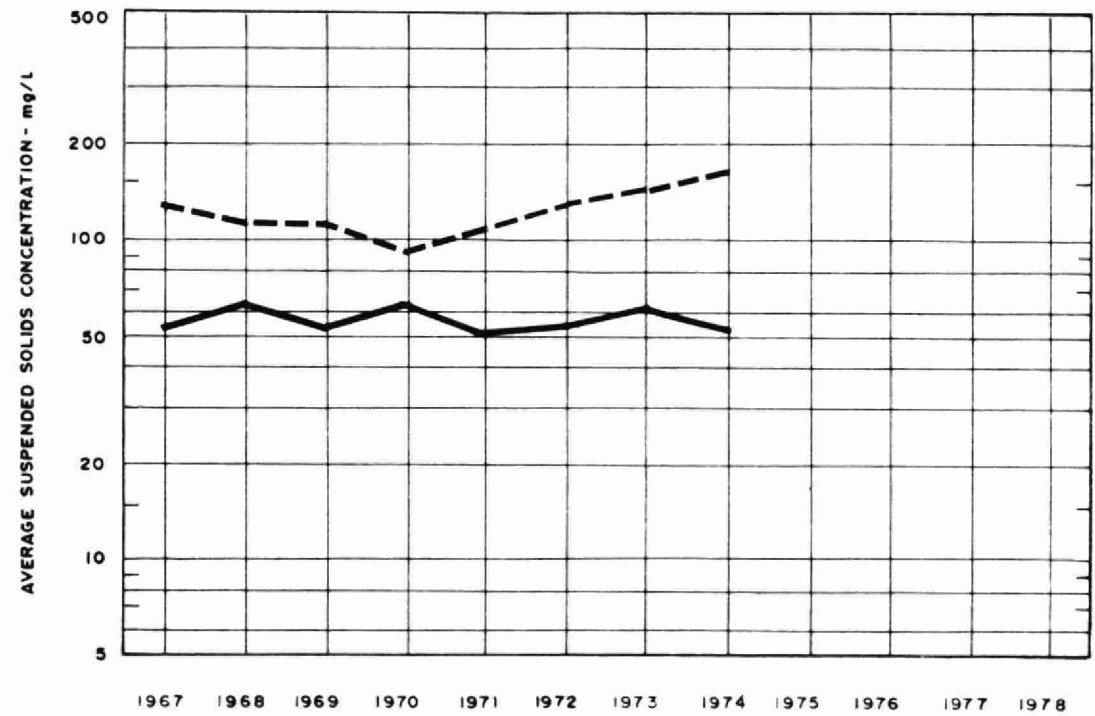


SUSPENDED SOLIDS

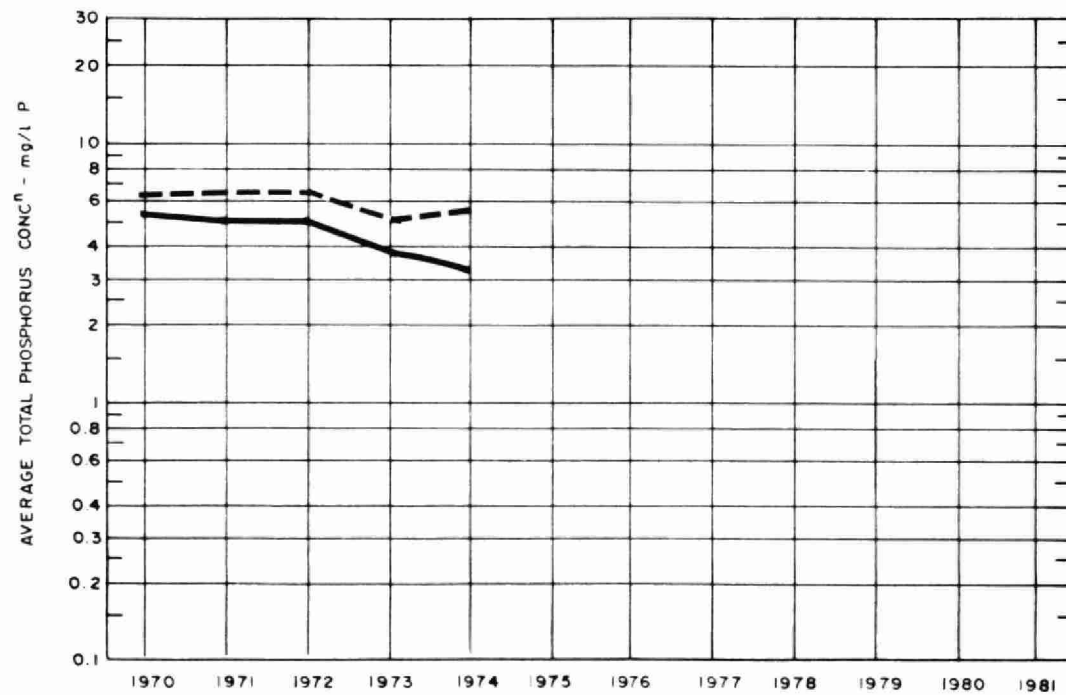
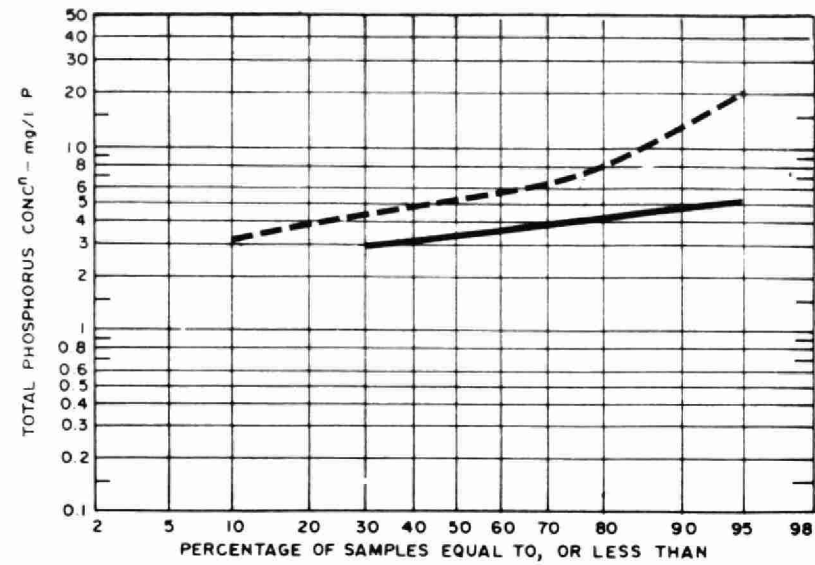


PLANT INFLUENT - - - - -

PLANT EFFLUENT _____



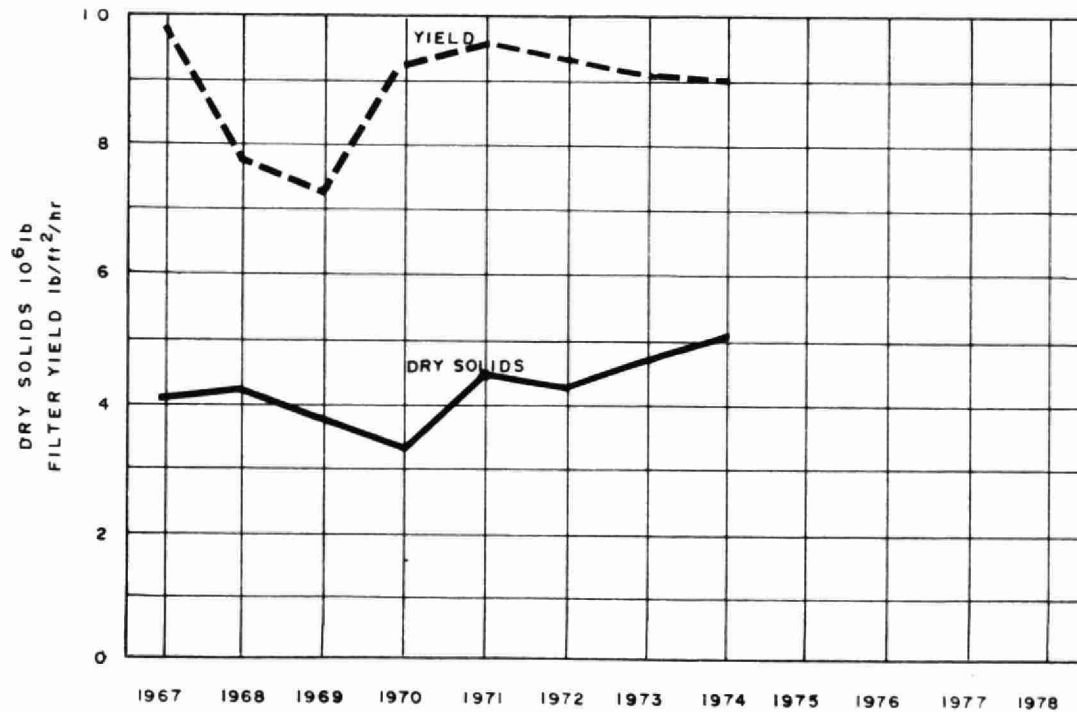
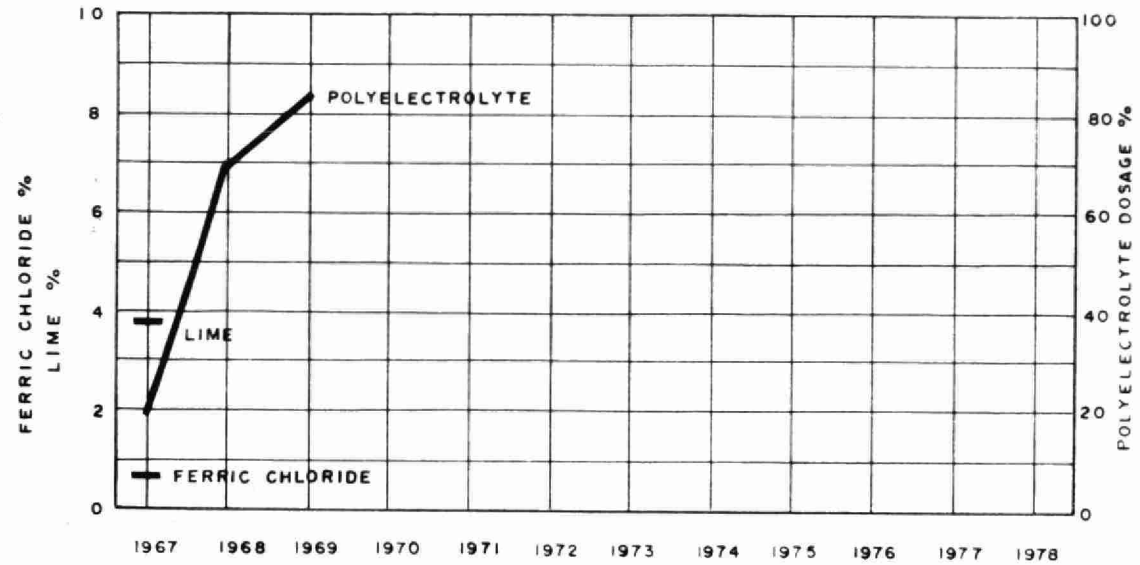
PHOSPHORUS



PLANT INFLUENT -----

PLANT EFFLUENT _____

VACUUM FILTRATION



TREATMENT DATA

MONTH	GRIT	CHLORINATION		VACUUM FILTER OPERATION						
	QUANTITY REMOVED cubic feet	CL ₂ USED 10 ³ pounds	AVG. DOSE mg/l	TOTAL FILTER HOURS	SLUDGE TO FILTERS			YIELD (AVG) lb/ft ² /hr.	FILTER CAKE T-S percent	SLUDGE HAULED cubic yards
					QUANTITY 10 ⁵ gallons	TOTAL SOLIDS percent	DRY SOLIDS 10 ⁵ pounds			
JAN	80	16	5.5	234	7.94	5.2	4.1	8.7	19.6	765
FEB	70	13	5.4	220	7.40	5.3	3.9	8.9	20.0	705
MAR	150	16	4.9	221	7.30	5.3	3.8	8.6	16.4	760
APR	250	16	3.4	217	7.31	5.2	3.8	8.8	20.8	690
MAY	140	17	6.0	228	7.70	5.3	4.1	8.8	20.3	735
JUNE	260	16	5.2	211	6.89	6.5	4.5	10.5	20.9	690
JULY	260	17	6.2	267	8.32	6.6	5.5	10.1	23.0	870
AUG	160	16	5.1	260	7.72	6.1	4.7	9.0	23.5	825
SEPT	400	17	5.4	278	7.78	6.3	4.9	9.0	20.6	900
OCT	850	15	5.1	261	7.55	6.4	4.8	9.3	21.4	870
NOV	80	19	5.6	245	7.08	6.8	4.8	9.7	21.0	780
DEC	100	20	9.8	226	6.82	5.3	3.6	8.0	21.4	690
TOTAL	2800	198		2869	89.81		52.5			9280
AVG.	.9	17	5.5	239	7.48	5.9	4.4	9.1	20.7	773

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